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ECONOMIC COMMISSION FOR AFRICA

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PROGRAMME OF ACTION FOR AFRICA (1980-1984)

80-446

PROGRAMME OF ACTION FOR AFRICA

(1980-1984)

NATIONAL LEVEL

1. The National Science and Technology for Development Base

For science and technology to play an effective role in national development, they must operate within a national framework and in a co-ordinated manner.

Programme Element 1.1: Establishment by each African government of a national "Centre" for Science and Technology for Development

In this context the word "Centre" is not meant to necessarily connote a physical monolithic structure. It is used as a "shorthand" for a national organ or mechanism the form and character of which is to be determined by each government, having regard to the structure and modus operandi of its governmental machinery.

The characteristic feature of the "Centre" is that it should have inputs from and effective linkages with:

(i) the national planning organization;

(ii) investment and financial institutions;

(iii) research and development institutions;

(iv) the education and training system;

(v) enterprises, public and private;

(vi) the industrial property system, technical and patent information;

(vii) standardization and quality control systems;

The following would be the functions of the Centre.

(i) to assist in the identification of technical needs for a variety of economic activities;

(ii) to assist in establishing policy instruments which encourage local innovations, and facilitate more rapid and less costly acquisition of technology;

(iii) to promote and assist in the generation of indigenous technology, linked specifically to design/engineering, research and development;

(iv) to initiate and monitor national science and technology policy, and prepare national science and technology plans;

(v) to assist in the acquisition and analysis of information on alternative sources of technology, indigenous and foreign, and in its dissemination among users;

(vi) to assist in the evaluation and selection of technologies for the different jobs to be done;

(vii) to assist in the unpackaging of imported technology, including assessment of its suitability;

(viii) to assist in the negotiation of the most suitable terms for imported technology, including arrangements for registration, evaluation and approval of agreements for its transfer;

(ix) to promote and assist absorption and adaptation of foreign technology;

(x) to promote the diffusion among users of technologies already assimilated, whether indigenous or foreign.

Programme Element 1.2: Initiation of Science and Technology Policy Programmes at the national level

This should cover areas such as:-

(i) endogenous development of technology, including R & D;

(ii) technology transfer;

(iii) development of critical natural resources;

(iv) science and technology manpower development and utilization;

(v) financing science and technology activities.

2. Manpower Development

Programme Element 2.1: Development of Technical Enterpreneurship

(i) expansion and intensification of technical training in the education system; "learning by doing";

(ii) introduction of basic management courses in existing conventional engineering and technical training curricula;

(iii) broadening of the training of engineers to include mastery of the practical elements of technology as well as the other related dimensions of the technology process.

Programme Element 2.2: Training Manpower in Critical Technical Fields

The establishment of training programmes in technical fields where there are acute shortages of manpower, such as, production engineering, industrial design, chemical engineering, metallurgy and in fields relevant to project preparation, evaluation etc.

Programme Element 2.3: Development of programmes to Train and Encourage More Women into Science and Technology

Programme Element 2.4: Mobilization of the Adaptive Technology Potential in the Informal Sector

There is a considerable amount of adaptive technology and technical creativity in way-side and village blacksmith and other mechanical workshops.

Programmes should be developed to mobilize these capabilities for (i) feeding into the productive sectors; (ii) training (through the process of "learning by doing") of school drop-outs; and (iii) technical training/ orientation of the rural population in general and women in particular.

Programme Element 2.5: Training Manpower in Technology Policy and Planning

(i) institution of long and short-term training programmes for personnel who will be engaged in formulating technology policies;

(ii) organizing intensive training programmes for policy makers, planners and administrators both in government and in major public and private concerns to increase their level of understanding of the technology policy issues relevant to the African economies. Such exposures would also raise their consciousness as to the need for technology policy programmes within their state machinery and the research component which will assist in building up a stock of knowledge, data and information on which to base the formulation of technology policy; and increase their ability to interpret the results of technology policy research;

(iii) training of national personnel for undertaking (a) technology policy research, and (b) national scientific and technological planning in their respective countries. In this connexion, there is need to generate a corpus of knowledge on methodology and procedures for technological planning within the context of overall national development planning.

3. Development of Local Productive Capacity

Programme Element 3.1: Utilization of mechanical production capacity available in large railway workshops for providing the needs (spare parts, simple agricultural implements and tools) of other productive and transportation sectors

Programme Element 2.4 also provides inputs into this programme element.

4. Rural Development

Programme Element 4.1: Development of Low-cost Rural Technologies

A common characteristic of the African population is its high rural component. About 80% of the people live in rural areas. To improve the quality of life of these rural populations and minimise the drudgery of their existence, it is necessary to develop and diffuse low-cost rural technologies.

These would involve such technologies as low-cost solar energy rural applications, biomass and wind-power.

5. Activation of the Development Sectors

Sectoral development programmes are thespearhead strategies through which national development is implemented.

5.1 Food and Agriculture

Programme Element 5.1(i)

Creation of a food and agriculture development policy and policy instruments with emphasis on the integrated development of the rural sector of the econony taking into account, inter alia, the following:

- the provision of institutional infrastructure for the training of required manpower, especially women, in identified priority areas of need (see programme elements 2.1, 2.3, 2.4);
- the identification and development of the natural resources (minerals, water, forest, fisheries etc.), including energy sectors with appropriate supporting industries with adequate standardization and quality control mechanisms;
- provision of adequate channels of communication linking the agricultural, transport and communications, industrial, planning, finance, labour and employment, research and other relevant sectors of the economy;
- provision of legal machinery at the national level to regulate land use and to foster subregional and regional multinational co-operation and how to use such mechanisms when established.

Programme Element 5.1 (ii)

Establishment of a Food and Agriculture Development Corporation which would perform, inter alia, the following functions:

- develop the necessary legal regulations,
- collect, analyse, catalogue and disseminate information: on alternative sources of technology, indigenous and foreign, for food and agriculture production; on the range and numbers of manpower and institutions available and required for the development of agricultural production and on diffusion mechanisms available for rapid dissemination of research results;
- encourage the development of new breeds of animals and strains of crops suitable for Africa and utilization of the findings and products for control of animal and crop diseases specific to Africa;
- development of fisheries including preservation of fishery products;
- initiate training programmes in pre-investment, project design, evaluation and implementation studies; in new exploration and evaluation techniques for sources of raw materials; in industrial design and chemical engineering; in basic management techniques, in negotiating transfers of technology;
- assist in the development of the rural physical infrastructure for transport and communications etc., etc.

5.2 Industry

Six areas have been identified by African Ministers of Industry as priority areas:

(i) food and agro-industries;

(ii) building materials and construction industries;

(iii) metals and metal products industries;

(iv) engineering and engineering products industries;

(v) chemicals industries; and

(vi) forest-based industries.

Action is to be initiated in the following areas:

- a capital goods industry to produce transport and communications equipment;
- agricultural tools and equipment;

- basic chemicals leading to fertilizer and pharmaceutical product production;

- key building materials, spare parts and components for the above products.

Programme Element 5.2 (i)

The creation of industrial policies and instruments which would ensure, inter-alia, the following:

- adequate integrated rural development and backward and forward linkages between and among the sectors mentioned above, the transport and communications systems, health facilities, water and energy supply, finance, the education and training system, research, labour and employment and other relevant sectors of the economy;

- provision of institutional infrastructure for the training of required manpower at all levels, especially women in the areas of need identified by the African Ministers of Industry (see particularly, programme elements 2.1, 2 3 and 2.4);

- provision of legal machinery for regulating the import of technology, for fostering regional and subregional co-operation and for establishing a structure or mechanism for generating action when external decisions are to be made etc., etc.

Programme Element 5.2 (ii)

The establishment of national development corporations in the following subsectors of industry, chemicals, metals, engineering, forestry, building materials and constructions which would perform, inter-alia, the following functions:

- evaluate existing capabilities in all the above sectors, and develop appropriate manpower development programmes in them as outlined in programme elements 2.1, 2.2 and 2.4, with a view to exploiting adequately the sectors identified;

- evaluate existing potential in domestic raw materials, existing facilities for financing, markets, and production of imports for the industries;

- conduct studies of the local environment and on the character and orientation of transferees and transferors, especially the TNC's, with a view to ensuring that the supply of technology matches the

demand (e.g., the creation of small-scale industries) and for creating policies to regulate the business activities of the TNC's;

- conduct studies on the kinds of structures developed by other third world countries e.g., China, Brazil, India, Mexico, Japan etc., to develop scientific and technological capabilities in the industrial sectors identified with a view to utilizing the results in pilot operations designed for initiating a self-sustaining industrial process;

- examine possible ways of generating locally funds for S & T activities in the industrial subsectors identified;

- examine the structural requirements to make best use at the national level of regional institutions with functions having a bearing on the development of the various sectors.

Programme Element 5.2 (iii)

The establishment and/or strengthening of the following national institutions:

(a) a consulting engineering and management institution with capabilities for feasibility studies, project evaluation and design, selection of equipment, evaluation of contracts etc., etc.;

(b) a standards and quality control institution.

5.3: Natural Resources Including Energy

The areas covered here are mineral, water and energy resources both land and sea-based.

Programme Element 5.3 (i)

Development of Policies and Policy Instruments for the Various Sectors (i.e., mining, water development and energy development)

The policy will ensure that proper backward and forward linkages exist between them and other sectors of the economy in order to promote integrated rural development. It will cover as in the other sectors the legal, education and training, institution building, scientific and technological information, R & D, transfer and development aspects of natural resources development and provide for the necessary linkages among sectors.

Programme Element 5.3 (ii): Establishment of a National Mineral Resources Development Corporation which would perform inter-alia, the following functions:

- develop necessary legal regulations;
- establish the mineral resource base (both land and sea based) by undertaking geological, mineral exploration and mapping;
- prospect, evaluate, extract and market the minerals;
- negotiate satisfactory agreements with foreign governments or TNC's for any of the functions above;
- make provisions for providing equipment, and training the range and quality of manpower taking into account programme elements 2.1, 2.2 and 2.4.

Programme Element 5.3 (iii): Establishment of a Water Resources Development Corporation which would perform, inter-alia the following functions:

- develop necessary legal regulations;
- establish an inventory of surface and ground water sources;
- develop special techniques for managing the water resources i.e., collecting data on water availability and quality, forecasting demand on various rural sectors and developing and utilizing technologies for recovery and recycling;
- develop technologies for collection of rural water, for supply (e.g., hand pumps and other implements) for irrigation, for treating polluted water, sea and brackish water and for disposal of waste water;
- negotiate technology transfers for activities outlined above if necessary but in favourable terms to the recipient country.

Programme Element 5.3 (iv): Establishment of an Energy Resources Development Corporation which would perform, inter-alia, the following functions:

- develop necessary legal regulations;
- conduct exhaustive inventory of the energy resources (land and sea-based) many geological, geophysical, air-borne etc., techniques and evaluate potential;

- assess demand and supply patterns periodically for rural household, agricultural, industrial, transport uses so as to develop view, energy techniques and to plan future management;

- develop efficient structures for energy distribution,

- collect, analyse, assess, catalogue and disseminate information, through various techniques, on technologies available locally and in the foreign market for the development of new and renewable sources of energy;

- make arrangements for the training of manpower at all levels with particular attention being paid to relevant manpower development under programme elements 2.1, 2.2 and 2.4,

- make arrangements for the development of R & D and production institutions for producing energy from waste materials, development of storage or conservation techniques, for rural electrification particularly;

- develop capabilities for negotiating agreement if necessary for the transfer of technology to perform various functions related to energy development;

- examine possible structures for the best manner of utilizing regional and subregional institutions.

5.4: Transport and Communications

Programme Element 5.4 (i) Support to and Active Participation in the Implementation of the Programme of the United Nations Transport and Communications Decade.

5.5: Health and Sanitation

Programme Element 5.5 (i): Development of a National Policy and Policy Instruments for the Improvement of National Health Planning Implementation and Education and the Development of Appropriate Health Technology

The policy should take into account, inter-alia, the following elements:

- legal machinery for development of health care;

- the overall need to provide health care to the community as a whole and particularly its poorest segments within the context of integrated rural development;

- the technology developed should be environmentally and culturally sound so as to ensure that equipment and drug selected will be manufactured at low cost (i.e., from indigenous materials) making provisions for acquiring information relevant to pressing problems of health care, and for the regular exchange of information from other countries such as China, India, Japan, etc.;

- on health policy and planning, institution building, development and acquisition of technique and know-how;

- the assessment of needs in terms of the range and numbers of personnel and institutions required within the context of integrated rural development;

- the development of appropriate linkages with the other vital sectors of the economy.

Programme Element 5.5 (ii): Establishment of Facilities such as a Health Development Institutes for the Production of Pharmaceutical Products from Local Materials

Such an institution will be responsible, inter-alia, for the following activities:

- develop necessary legal regulations;

- drawing up an inventory of essential drugs necessary to cure crippling diseases;

- intensive studies (R & D) into the effectiveness of medicinal plants for treating various transmisible diseases and cataloguing cures; special attention to be paid to identifying suitable forest resources;

- the judicious selection of middle level manpower for training under programme element 2.1 and 2.2 to work with health research workers in universities and hospitals to produce health equipment at low cost;

- the elevation of traditional medicine from the informal to the formal health sector especially in the rural areas and the training of such practioners in basic health procedures in various fields (e.g., family planning, preventive health care, available food products in the rural areas of high nutritional value), the encouragement of R & D activities in this sector;

- the establishment and improvement of training institutions for para-medical and nursing personnel at required levels;

- co-ordinate the collection, analysis, assessment, cataloguing and dissemination of relevant health information from indigenous and foreign sources;

- expansion and improvement of medical and nursing services and facilities for both urban and rural areas.

5.6: Housing and Urban Development

Programme Element 5.6 (i): Establishment of Policy and Policy Instruments Similar to those to be Established for the Development of the Building Materials and Construction Industry

In this connexion, appropriate attention should be paid to the development of specifications (i.e., building construction requirements with reference to particular materials and methods) and performance (design and engineering criteria) codes.

Programme Element 5.6 (ii): Establishment of a Housing Development Corporation to Perform, inter-alia, the Following Functions:

- develop the necessary legal regulations;

- establish a coherent national system of codes and standards, and develop techniques and processes etc., for testing and quality control;

- promote the development of self-help construction by providing design standards manuals and codes etc., for simple housing units for the urban and rural areas;

- collect, analyse, assess, catalogue and disseminate information indigenous and foreign on housing and urban development technologies, planning methods etc., etc;

- make provision for adequate utilities in particular, water, sewerage and waste disposal systems;

- take steps to create a national centre for tropical architecture and urban and rural planning and design;

- examine possible structures to be created at national level to make best use of subregional, regional and international institutions.

5.7: Environment

Programme Element 5.7 (j): Establishment of Machinery to Assess the Impact on the Environment of Development Activities

This will embrace activities in all the sectors mentioned above with a view to minimizing or eliminating altogether their harmful effects on the bio-sphere.

Programme Element 5.7 (ii): Introduction of Measures to Support Research at the National, Subregional, and Regional Levels Relevant to the Establishment of Networks for Monitoring and Predicting Natural Disasters well in Advance so that Appropriate Preventive and Precautionary Action can be Taken at the National Level in Good Time.

6. Mobilization of Funds for Science and Technology (National Level)

In recognition of the vital role that science and technology play in national development, governments are urged to demonstrate their political will and commitment by taking steps to ensure that appropriate allocations are made from their national budgets on a regular and continuing basis in fulfillment of their share in the implementation of the agreed programme of action. In this regard, the following illustrative list of action programmes is proposed:

6.1: Establishment of a National Science and Technology Development Finance Agency (NSTDFA)

Similar financing agencies like National Housing Banks, Rural Development Banks have been established to spearhead activities in related sectors considered critical to the economy.

6.2: Allocation of a certain percentage of taxes derived from consumption of imported items to the R & D activities for the local production of their equivalents and utilizing local resources.

6.3: Institution of a levey on the gross income or turnover of major States and private enterprises engaged in production activities. Such levies should be paid into the(NSTDFA) to support science and technology activities on a national basis.

6.4: Governments should require all firms and enterprises with a foreign equity holding to allocate a fixed percentage (to be determined nationally) of their total expenditures to nationally approved R & D activities within these enterprises. Where this cannot be done, the firms should contribute an equivalent amount to the (NSTDFA).

7. SUBREGIONAL AND REGIONAL LEVELS

Programme Element 7.1: Support to the Operations of Regional and Subregional Intergovernmental Technological Institutions

Several regional and subregional technological institutions have been established following decisions taken by the governments of the countries of the African region. These institutions, while operating each in its field of competence, are expected to co-ordinate their activities to ensure that both singly and collectively they assist the countries of the region to strengthen their technological capabilities and exploit and develop their natural resources to the best advantage.

The following is an illustrative listing of such institutions:

(i) African Regional Centre for Technology (Dakar, Senegal);

(ii) African Regional Centre for Engineering Design and Manufacturing (Ibadan, Nigeria);

(iii) African Institute for Higher Technical Training and Research (Nairobi, Kenya);

(iv) Industrial Property Organization for English-speaking Africa (Nairobi, Kenya);

(v) OAPI (Yaounde, Cameroon);

(vi) East African Mineral Resources Development Centre (Dodoma, Tanzania);

(vii) African Regional Organization for Standardization;

(viii) African Remote Sensing Council and its relevant Centres (Ouagadougou, Kinshasa, Cairo, Ile-Ife, Nairobi);

(ix) Regional Centre for Training in Aerial Surveys (Ile-Ife, Nigeria);

(x) Regional Centre for Services in Surveying and Mapping (Nairobi, Kenya)

Other institutions at various stages of establishment are:

(i) Central African Mineral Resources Development Centre;

(ii) Regional Centre for Solar Energy Research and Development.

The successful operation of these intergovernmental institutions depends to a large measure on financial contributions from the member States.

Governments are invited to take steps to ensure the regular payment of their contributions at the agreed intervals, so as to enable these institutions to perform the functions that the governments themselves have assigned to them in furthering the development and progress of Africa.

Programme Element 7.2: The Multinational Teaching Company

The history of the development of technology in countries such as Japan, China, India, South Korea, Mexico and Brazil, provides Africa with several lessons worthy of emulation.

In particular, the carefully planned institutionalization of the "learning by doing" process is recommended for serious attention. Institutions which are "engineering equivalents" of teaching hospitals should be established, initially at the subregional level.

Steps should be taken to establish four (4) Multinational Teaching Companies, one for East and Southern Africa, one for Central Africa, one for West Africa and one for North Africa.

Subregional and Regional Co-operation

Programme Element 7.3: Establishment of Subregional Institutions/Associations of Technical Consultants

The region continues to rely heavily on external sources for consultancy in the planning and preparation of development projects including feasibility studies, project preparation and evaluation, project design and monitoring of implementation.

A few indigenous consultancy agencies exist, but these require strengthening and increased capability.

Through subregional and regional co-operation, institutions/associations of indigenous technical consultants should be established at a subregional level to assist in the development and strengthening of national consultancies and to handle multi-national and, where appropriate, complex national projects.

Programme Element 7.4: Development of Women's Exchange Programmes for the Improvement of Skills in Traditional Weaving, Dyeing and General Handicrafts

Subregions of Africa are noted for highly developed traditional skills in weaving, dyeing, local production of toys and general handicrafts.

Women's exchange programmes should be developed on a subregional basis, through the ECA MULPOC's, for importing these skills from subregion to subregion thus diffusing the skills generally throughout Africa.

8. INTERNATIONAL LEVEL

Programme Element 8.1: Financial and Technical Assistance

Of the regional groupings of countries of the world that constitute the developing countries (Group of 77), Africa is the largest in terms of number of countries, has the largest concentration of the least developed countries, and is the most backward and disadvantaged in the field of science and technology for development. Africa, therefore, deserves to be accorded serious and urgent attention in the allocation and disbursement of the Interim Fund for Science and Technology for Development during the two years of operation of this fund under the adminstration of UNDP.

African governments should request a total allocation of the order of 40 per cent of the Fund.

The following are proposals for disbursement of this allocation:

(i) assistance to countries in developing and implementing projects under Programme Element 1.1 (ECA);

(ii) assistance to countries in developing and implementing projects under Programme Element 1.2 (ECA);

(iii) assistance to countries in developing and implementing projects under Programme Element 2.1 and 2.4 (ECA and ILO);

(iv) assistance to countries in developing and implementing projects under Programme Element 2.2 and 2.3 (ECA, UNESCO, UNIDO);

(v) assistance to countries in developing and implementing projects under Programme Element 2.5 (ECA);

(vi) assistance to countries in developing and implementing projects under Programme Element 4.1 (ECA, ILO, UNESCO, UNICEF, FAO);

(vii) for UNDP preparatory assistance and full-scale projects with the appropriate executing agencies under Programme Elements 5.1 - 5.7;

(viii) for UNDP preparatory assistance and full-scale projects with the appropriate executing agencies under Programme Element 6.1;

(ix) preparatory assistance for the establishment of the industrial complexes under Programme Element 6.2 (ECA, OAU, UNIDO, FAO);

(x) preparatory assistance for the establishment of the subregional institutions/associations under Programme Element 7.3 (ECA, OAU);

(xi) for the development and implementation through ECA MULPOC's of the women's exchange programmes under Programme Element 7.4 (ECA, OAU);

9. Other Sources of Funding:

Governments are urged to continue to seek funding on an increased scale from the regional and international funding agencies which have in the past provided financing for development projects. Some of these are ADB, IBRD, World Bank, IFAD and ABADEA.